Volume Title: Mortgage Lending Experience in Agriculture

Volume Author/Editor: Jones, Lawrence A. and David Durand

Volume Publisher: UMI

Volume ISBN: 0-870-14149-X

Volume URL: http://www.nber.org/books/jone54-1

Publication Date: 1954

Chapter Title: APPENDIX A AN ANALYSIS OF MORTGAGE EXPERIENC STUDIES

Chapter Author: Lawrence A. Jones, David Durand

Chapter URL: http://www.nber.org/chapters/c2952

Chapter pages in book: (p. 199 - 221)

APPENDIX A

AN ANALYSIS OF MORTGAGE EXPERIENCE STUDIES

Illustrations of Method

THE first comprehensive statistical analyses of farm mortgage experience were those made around 1930 by F. F. Hill and by E. C. Johnson, covering federal land bank loans in the Northeast and in Minnesota, respectively.[1] Since that time five similar studies have been published by various agricultural experiment stations, several of them done with the cooperation of federal land banks, and two studies have been presented as doctoral dissertations.

To illustrate Hill's approach, Table A-1 shows, for 9,153 federal land bank loans in New York state, the relation between foreclosure experience and the value per acre of the mortgaged land. Two indices of foreclosure experience are given: the percentage of foreclosures on loans secured by farms in each land-value class, and the rate of loss for each class of loans. Although both indices show worse than average experience for the low-valued land, and vice versa, they do not imply precisely the same thing. The foreclosure rates measure the ability of farms in the several land-value classes to avoid financial difficulty during the period under review; they imply that low-valued land, presumably poor land, is a cause of farm mortgage distress, and that the appraised value of land can be used to predict the success of a mortgage. The loss rates, on the other hand, measure financial risk to the lender and are therefore of particular interest for lenders wishing to calculate differential reserve requirements for loans secured by farms differing in value, or to determine how much allowance should be made for the loss factor in calculating lending costs.

In general, losses tend to be high when foreclosures are high, but the correspondence is far from perfect. Table A-1, for example, shows that farms on land valued at less than $30 an acre had 7.2 percent foreclosures, which was only 1.7 times as great as the average; but these same farms had losses of $27.39 per thousand dollars loaned, which was four times the average. Consequently, a statistical study of mortgage experience must include loss rates as well as foreclosure rates if it is to be of the greatest possible value to lenders in formulating loan policy. Seven of the nine studies reviewed here include both loss rates and foreclosure rates.

[1] F. F. Hill, *An Analysis of the Loaning Operations of the Federal Land Bank of Springfield from Its Organization in March, 1917, to May 31, 1929* (Cornell University Agricultural Experiment Station, Bulletin 549, December 1932); E. C. Johnson, *Farm Mortgage Foreclosures in Minnesota* (University of Minnesota Agricultural Experiment Station, Bulletin 293, 1932).

TABLE A-1

Relation of Appraised Value per Acre to Land Bank Loan Experience in New York State, 1917-29

Appraised value of farm per acre	*Number of loans made*	*Loans foreclosed*		*Net loss on foreclosed farms per $1,000 loaned*
		Number	Percentage	
Less than $30	1,243	89	7.2%	$27.39
$30-59	3,604	169	4.7	7.79
$60-99	2,411	70	2.9	
$100-199	1,444	45	3.1	3.54
$200 and over	451	8	1.8	
All land-value classes	9,153	381	4.2%	$6.84

From *An Analysis of the Loaning Operations of the Federal Land Bank of Springfield from Its Organization in March, 1917, to May 31, 1929,* by F. F. Hill (Cornell University Agricultural Experiment Station, Bulletin 549, December 1932), Tables 14 and 15, pages 25 f.

Table A-2, taken from E. C. Johnson's Minnesota study, presents a statistical technique alternative to that in Table A-1. It uses two separate percentage distributions of farmer-borrowers according to age, one for the good loans and one for the foreclosed loans. Since the foreclosed group contains relatively more young farmers than the good loan group, it can be concluded that the younger farmers are probably poorer risks than the older farmers. A rough calculation of the average age of borrowers for the two groups gives 43.9 years for the foreclosed loans and 46.0 years for the good loans. The method of analysis illustrated here is less straightforward than the method of Table A-1, for it shows foreclosure rates only indirectly and does not so much as imply loss rates. However, it has the advantage of saving clerical labor, since it often permits a reduction in the number of loans studied. Instead of analyzing a lender's entire portfolio, one can take all the foreclosed loans and an equal, or nearly equal, control sample of good loans.

Table A-3 summarizes the results of nine mortgage experience studies. Although insufficient to provide a comprehensive picture of foreclosures in the United States, together they cover a variety of geographical areas and types of farming, from potatoes in eastern Maine to grain and livestock in Montana. They give a good deal of information on foreclosure experience and serve to illustrate the kind of results obtainable by the methods described above. All told, twenty-three factors affecting credit experience have been listed, which we group, for the sake of convenience, in five broad

TABLE A-2

Percentage Distribution of Land Bank Loans in Minnesota by Age of Borrower

Age of borrower	*Foreclosed loans*	*Good loans*
30 yrs. and under	14.3%	8.4%
31-40	26.4	25.6
41-50	27.8	29.6
51-60	20.6	22.8
61-70	9.6	11.6
70 and over	1.3	2.0
Total	100.0%	100.0%

From *Farm Mortgage Foreclosures in Minnesota*, by E. C. Johnson (University of Minnesota Agricultural Experiment Station, Bulletin 293, 1932), Table 15, page 15.

categories as follows: (1) Physical characteristics of the farm. (2) Physical characteristics of buildings and equipment. (3) Personal characteristics of the borrower. (4) Farm organization. (5) Financial characteristics of the loan.

Physical Characteristics of the Farm

The purely physical characteristics analyzed by mortgage experience studies include soil type, elevation, and topography. All these factors would be taken into account by a competent appraiser and by most prospective purchasers. Yet the real importance of physical attributes lies in their economic manifestations. Under existing farm technology, certain combinations of soil, climate, and topography are particularly well adapted to efficient agricultural production; they therefore earn a higher return than the less favorable combinations, and they usually command a higher market price.

At the present time considerable efforts are being made, both by lenders and by agricultural economists, to classify and map land according to its economic value, or income earning capacity. Several systems of economic classification are now in use, including the "land class" system used by a number of the eastern land grant colleges, and the "net income area" system used by one or two western states and some of the federal land banks. In most of them the actual mapping process is based on two very different types of evidence: tangible manifestations of prosperity, and correlative information on physical productivity. The manifestations of prosperity are usually obtained from a roadside survey covering the general appearance of private buildings and equipment, the num-

TABLE A-3

Findings of Nine Mortgage Experience Studies Summarized

Code: XX, strong, definite findings; X, definite findings; C, definite findings contradicting those of other studies; O, findings negative or uncertain

Factors	*A. G. Nelson: Iowa loans*	*F. F. Hill: Springfield land bank loans*	*Ackerman & Norton: Illinois loans*	*C. H. Mereness: Alabama loans*
Characteristics of farm				
Soil	....	....	XX	XX
Elevation	....	X	....	....
Topography	....	....	X	X
Yield per acre	....	....	O	X
Appraised value per acre	....	XX	[a]	[a]
Land class or net income	XX	....	....	....
Transportation facilities and utilities	....	X	X	....
Characteristics of buildings & equipment				
Value of house	....	XX	O	....
Value of barn	....	O	....	....
Value of all buildings	....	X	O	....
Value of machinery	....	....	....	....
Personal Characteristics				
Age	....	O	O	....
Experience	....	X	O	....
Farm organization				
Type of farming	....	....	O	....
Number of hens	....	X	X	....
Number of cows	....	....	O	....
Total acres in farm	....	X	X	XX
Productivity values	....	....	....	....
Financial factors				
Amount of loan	....	....	....	....
Loan-to-value ratio	XX	X	XX	XX
Amount of loan per acre	O	....	....	C
Method of acquiring farm	....	O	O	....
Time when loan was made	....	X	XX	....

(continued on next page)

TABLE A-3 (continued)

Code: XX, strong, definite findings; X, definite findings; C, definite findings contradicting those of other studies; O, findings negative or uncertain

Factors	*S. W. Warren: New York state loans*	*C. Merchant: Aroostook county, Me. loans*	*Eckert & Maughan: Montana loans*
Characteristics of farm			
Soil	XX	....	XX
Elevation	X	....	....
Topography	....	....	....
Yield per acre	....	....	XX
Appraised value per acre	....	XX	....
Land class or net income	....	....	....
Transportation facilities and utilities	X	X	....
Characteristics of buildings & equipment			
Value of house	X	....	....
Value of barn	X	....	....
Value of all buildings	....	X	XX
Value of machinery	....	....	....
Personal characteristics			
Age	O	O	....
Experience	....	X	....
Farm organization			
Type of farming	....	....	X
Number of hens	....	....	....
Number of cows	....	....	....
Total acres in farm	....	....	C
Productivity values	....	....	XX
Financial factors			
Amount of loan	X	....	....
Loan-to-value ratio	....	....	X
Amount of loan per acre	O	....	X
Method of acquiring farm	....	O	....
Time when loan was made	X[b]	....	X

(concluded on next page)

TABLE A-3 (concluded)

Code: XX, strong, definite findings; X, definite findings; C, definite findings contradicting those of other studies; O, findings negative or uncertain

Factors	*E. C. Johnson: Minn. loans*	*K. O. Hanson: W. Wash. loans*	*Remarks*
Characteristics of farm			
Soil	X	....	Good soils produce good loans
Elevation	....	....	Usually related to soil type
Topography	....	....	Usually related to soil type
Yield per acre	....	....	
Appraised value per acre	O	....	Reflects differences in soils and other physical productivity factors
Land class or net income	....	XX	
Transportation facilities and utilities	....	....	
Characteristics of buildings & equipment			
Value of house	X	....	Good house usually a good sign
Value of barn	....	....	Good barn on poor land a bad sign
Value of all buildings	X	....	
Value of machinery	X	....	
Personal characteristics			
Age	X	....	Older borrowers slightly better
Experience	....	....	
Farm organization			
Type of farming	....	XX	
Number of hens	....	....	
Number of cows	X[c]	....	
Total acres in farm	X	XX	Large farms usually have poor experience
Productivity values	....	....	
Financial factors			
Amount of loan	....	....	
Loan-to-value ratio	X	XX	
Amount of loan per acre	X	....	
Method of acquiring farm	....	....	
Time when loan was made	X	....	Loans made around 1920 had high foreclosure rates

A bibliographical listing of the studies is given in footnote 1, page 135.

[a] When loans were broken down by soil type, appraised value was not important within type classifications.

[b] In southern New York loans made in 1917-21 had high foreclosure rates; in western New York they had low rates.

[c] Includes all livestock.

ber and quality of public buildings such as schools and churches, the quality of roads, and the availability of public utilities and services. All these furnish useful indications of farm earning power within the area. The indications are then checked against available evidence of physical productivity, such as soil maps and crop yields. In short, classifications by land class or net income area reflect a long list of factors—including the purely physical attributes determining farm productivity.

Naturally, appreciable differences may be found among the various systems of land classification. Chapter 6 mentioned two systems used in western Washington. The net income area system, used by the Federal Land Bank of Spokane, takes account of sources of off-farm income, which are important to part-time farmers. On the other hand, the economic land use system, used by the State College of Washington and the State Department of Conservation and Development, covers only income from farming operations. Thus the two systems give quite different indications in areas that are not well adapted to full-time farming but have good employment opportunities for part-time farmers. Table A-4, adapted from Hanson's material, shows that foreclosure experience varies greatly within economic land use classes when farms in those classes are broken down by net income area as well.

Land class maps were not available to those who made the first mortgage experience studies. These pioneers either used appraised value as a rough substitute or obtained information on the strictly physical characteristics of the farms surveyed. Hill's tabulation of loans by appraised value (Table A-1) has already been presented. An example of a breakdown according to physical soil type, by Mereness, is presented in Table A-5. There is a marked variation in foreclosure rates, and an even greater variation in loss rates. Furthermore, the soils with the best experience are almost invariably the more highly valued.

Farm topography is sometimes a key factor affecting productivity. If the terrain is sufficiently rough, it will discourage and perhaps even prevent the use of efficient farm machinery. In addition, rough terrain is more susceptible to erosion than level or slightly rolling terrain. Thus topography is often related to soil quality, especially in areas that have been farmed for many years. Ackerman and Norton, who analyzed this factor, found that loans on level farms in Illinois had better experience than loans on rough or rolling farms.[2]

Elevation is frequently associated with soil quality as well as with length of growing season, topography, and accessibility to

[2] Joseph Ackerman and L. J. Norton, *Factors Affecting Success of Farm Loans* (University of Illinois Agricultural Experiment Station, Bulletin 468, August 1940), Table 6, p. 471.

TABLE A-4

Land Bank Loan Experience in Western Washington, by Net Income Area within Economic Land Use Class

Economic land use class and net income area	*Number of loans made*	*Number of acquisitions as a percentage of loans made*	*Loss per $1,000 loaned*[a]	*Cultivated acres per farm*	*Percentage of land cultivated*
Land use class 1					
Income area 1	128	2%	$+3	60	84%
Land use class 2					
Income area 1	57	0	0	36	67
Income area 2	672	6	15	37	64
Land use class 3					
Income area 2	86	2	+10	22	60
Income area 3	1,835	10	32	26	47
Land use class 4					
Income area 3	1,083	8	22	15	41
Income area 4	1,189	18	84	22	34
Land use class 5					
Income area 3	212	7	17	9	36
Income area 4	851	17	81	14	28
Income area 5	332	30	157	19	22
Land use class 6					
Income area 5	9	33	317	15	14

Adapted from *Federal Land Bank Loan Operations in Western Washington, 1917-49,* by Kermit O. Hanson (Iowa State College, unpublished Ph.D. thesis, 1950), Table 8, page 32.

[a] Plus denotes gains.

markets. Warren found in his study of loan experience in southern New York that the percentage of foreclosures increased with elevation (Table A-6).

Since good transportation facilities, such as hard roads and a nearby central shipping point, contribute to farm efficiency, it is natural to suppose that such factors would be related to foreclosure experience. The four studies that covered transportation factors—Hill's, Warren's, Ackerman and Norton's, and Merchant's—did show an appreciable relation. Hill, for example, found a foreclosure rate of 1.9 percent for farms on improved roads in contrast to 4.5 percent for farms on unimproved roads more than two miles from the shipping point, which rates compared with an over-all rate of 3.3 percent for all farms.[3] In Aroostook county, Merchant found, land bank loans on farms two miles or less from a shipping point had a foreclosure rate of 10.6 percent, in contrast with 24.4

[3] Hill, *op.cit.,* Table 58, p. 58.

TABLE A-5

Relation of Type of Soil to Loan Experience and Other Factors, Southeastern Alabama, 1917-31

Type of soil	*Number of loans made*	*Appraised value per acre*	*Average loan per acre*	*Loss per $1,000 loaned*	*Percentage of loans foreclosed*
Norfolk sandy loam and fine sandy loam	1,306	$52	$19	$19	6%
Norfolk gravelly sand	43	45	17	32	7[a]
Greenville sandy loam	356	58	22	17	8
Ruston sandy loam	292	54	19	29	8
Greenville loamy sand	283	52	20	20	11
Orangeburg sand and fine sand	139	35	12	33	11
Ruston loamy sand	57	42	15	30	12
Orangeburg sandy loam and fine sandy loam	271	39	14	30	13
Norfolk fine sand	89	32	12	49	15
Norfolk loamy sand	144	47	17	67	18
Kalmia, Leaf, Myatt, Cahaba and Congaree fine sandy loams	132	31	11	114	26
Norfolk sand	684	33	12	102	27
Kalmia sand	58	33	12	148	33
Susquehanna fine sandy loam	303	30	11	152	34
Kalmia fine sand	88	29	10	218	47
All soil types[b]	4,750	$42	$15	$54	15%

From *Farm Mortgage Loan Experience in Southeast Alabama*, by E. H. Mereness (Alabama Polytechnic Institute Agricultural Experiment Station, Bulletin 242, January 1935), Table 1, page 4.

[a] Probably this soil type is not as good as the figure would indicate; the number of farms included may be too small to be representative.

[b] Includes mixed and unclassified soil types in addition to the listed types.

TABLE A-6

Relation of Elevation to Foreclosure Experience and Other Factors, Southern New York, 1917-29

Elevation above sea level (feet)	*Number of loans made*	*Average loan*	*Average acreage per farm*	*Percentage of loans foreclosed*
Less than 1,300	687	$3,540	132	18%
1,300-1,499	397	2,610	141	19
1,500-1,699	292	2,357	155	34
1,700 and over	84	2,371	183	42

From *Results of Farm-Mortgage Financing in Eleven Counties in New York State*, by S. W. Warren (Cornell University Agricultural Experiment Station, Bulletin 726, December 1939), Table 22, page 18.

percent for loans on farms more than eight miles from a shipping point.[4] But the significance of the findings on transportation is beclouded by the fact that land favorable to the construction of roads and railways—because of level terrain, good drainage, and the like—is usually also favorable to farming. Moreover, there is a question of cause and effect. Good roads are frequently built past good farms because such farms are capable of paying higher taxes; and shipping points may be located in the most prosperous areas because these promise better business.

Buildings and Equipment

It is well known that the character and condition of farm buildings and equipment in an area usually reflect the basic productivity of the land. In fact, much of the economic classification of land (such as the mapping of land classes or net income areas) relies heavily upon a roadside appraisal of buildings, equipment, and other tangible evidence of prosperity. To an extent, of course, good buildings and equipment, like good land, actually contribute to farm income and debt paying ability, provided they are properly adapted to the size and type of the farm enterprise. Equipping a farm is a problem in the proper proportioning of productive factors. Too little equipment, or the wrong kind, results in physical inefficiency and ineffective use of labor; too much equipment, however, may result in financial inefficiency because it imposes maintenance burdens and capital costs that are not compensated by increased physical efficiency.

Five of the studies reviewed here obtained information on the combined value of all farm buildings, and four of them showed a significant tendency for foreclosure rates to be high for farms with low-valued buildings. In the fifth study, by Ackerman and Norton, the relationship did not appear significant. Concerning specific items of buildings and equipment, the most definite evidence, obtained by Hill, refers to the appraised value of farmhouses in the Springfield land bank district. It brings out two important points: first, that the good houses tend to be located on the good land; and second, that on land of similar quality, loans on farms with good houses are foreclosed less frequently than the loans on farms with poor houses (Table A-7), and the losses entailed are smaller. Since the farmhouse is largely a consumption good, it does not contribute directly to the productivity of the farm, but it definitely reflects farm earning power. A poor farm will not support a fine, comfortable house. The residence value of the house, moreover, does add considerably to the market value of the property—par-

[4] Charles H. Merchant, *Farm Credit in Aroostook County, Maine* (University of Maine Agricultural Experiment Station, Bulletin 418, April 1943), Table 52, p. 372.

ticularly in thickly settled areas within commuting distance of cities. In case of default and foreclosure, a farm with a good house can often be sold or rented as a country home. Finally, the better the farmhouse, the more likely it is that a farmer who cannot farm his land profitably will continue living on his farm even though he shifts to nonfarm employment.

Ackerman and Norton's study of Illinois farm loan experience tends to confirm Hill's findings. It shows clearly that the good houses are more often located on the good farms. It also shows perceptibly smaller foreclosure rates and loss rates for farms with good houses, but the tendency is not pronounced, as it was in Hill's observations, and the significance of the statistical relationship is questionable.

TABLE A-7

Relation of Appraised Value of Farm Residence and Appraised Value of Tillage Land to Land Bank Foreclosure Experience in the Northeast, 1917-29

Appraised value of farm residence	*Appraised value per acre of tillage land*	
	Less than $55	$55 and over
Less than $2,500		
Number of loans made	6,414	4,934
Percentage of loans foreclosed	5.2%	3.0%
$2,500 and over		
Number of loans made	1,984	6,592
Percentage of loans foreclosed	3.1%	1.9%

From *An Analysis of the Loaning Operations of the Federal Land Bank of Springfield from Its Organization in March, 1917, to May 31, 1929,* by F. F. Hill (Cornell University Agricultural Experiment Station, Bulletin 549, December 1932), Table 77, page 76. The data cover loans made by the Springfield land bank in New England, New York, New Jersey, and Pennsylvania.

Farm equipment was analyzed only in the study of Minnesota loans by E. C. Johnson. He found that farms with comparatively small investment in machinery accounted for a greater proportion of the foreclosed loans than of the unforeclosed.

Evidence that good buildings may sometimes be associated with poor mortgage experience was presented by Warren, who analyzed the value of barns in New York. He says:

"In land classes I and II in southern New York, an average loan of $1020 was made on farms where the barn was valued at less than

$500. Fifteen per cent of these loans were foreclosed. On farms where the barn was valued at $2500 or more, an average of $3306 was loaned, and half of these loans were foreclosed. On land which is not adapted to agriculture, a good barn does not indicate a high debt-paying capacity.

"In land class III in southern New York, where the barn was valued at less than $1500, an average of $1992 was loaned, and 16 per cent of these loans were foreclosed. Where the barn was valued at $3500 or more, an average of $5012 was loaned, and 14 per cent of the loans were foreclosed. On land which has agricultural value, a good barn usually indicates a higher debt-paying capacity."[5]

Although we doubt whether the differences in foreclosure rates observed in land class III are significant, the variations in land classes I and II appear to be important. They definitely suggest that a high-priced barn on poor land represents an unbalanced combination of productive factors, and perhaps an unnecessary financial burden.

Personal Characteristics of Borrower

Lenders generally agree that a good farmer, as well as a good farm, is essential to a good loan. Good technical management is required to obtain the highest physical productivity from a farm. It is particularly important wherever there is an erosion hazard, for a few years of carelessness may result in impaired earnings and reduced collateral value. Financial acumen and attitude toward obligations are also important. Some lenders even stress the importance of investigating the family situation. Are domestic relations harmonious? Are the wife and children contented? If not, the family may break up or move to the city.

The importance of personal characteristics must be accepted largely on faith because of the difficulties of objective measurement. How is one to measure a farmer's managerial ability, his integrity, his industry, or the stability of his family relations?[6] Of the few

[5] S. W. Warren, *Results of Farm-Mortgage Financing in Eleven Counties in New York State* (Cornell University Agricultural Experiment Station, Bulletin 726, December 1939), pp. 19 f.

[6] There are two possible approaches to the measurement of managerial ability. The first is by means of the past performance record. That is the method of business loan analysis. It requires detailed records of earnings and operations going back over a period of years. These are seldom available in the agricultural field, and they are never available for the young farmer just starting out. One of the drawbacks of the method is that it does not really measure ability. A good earnings record implies a combination of a good farm and good management. But it does not separate the effect of good management from good soil, good equipment, and good location. The second approach is the psychological aptitude test. Although used extensively in industrial personnel placement, it is seldom used in agriculture. Whatever the possibilities in such testing—and they may be considerable—it is clearly a job for the psychologist.

personal characteristics analyzed statistically, none has been a good measure of farming ability, and none has shown a close relation to foreclosures. For example, tabulations of borrowers' ages have shown very little variation in foreclosure rates. Table A-2, which is from Johnson's study, implied slightly better experience for older borrowers. Federal land bank loans in Aroostook county, Maine, showed a slight superiority for borrowers over 65. Hill's study, on the other hand, showed a slight superiority for borrowers between 40 and 60. Ackerman and Norton found no variation great enough to be considered statistically significant. Moreover, all the foregoing results have probably been affected by the fact that borrowers' ages are almost certainly related to the year in which their farms were purchased. Thus, if a wave of young farmers bought farms during the inflation of the World War I period, one would expect to find a wave of middle-aged farmers having mortgage difficulties during the thirties.

Analysis of borrowers' previous farming experience was somewhat more conclusive than the analyses of borrowers' ages. On land bank loans in Aroostook county there were 19.0 percent foreclosures for inexperienced farmers in contrast with 12.9 percent for the more experienced. Hill's study showed a similar relationship for farms valued at $60 or less per acre but no significant difference for higher-valued farms (Table A-8). Inexperience, coupled with low-valued land—presumably of low productivity—resulted in a high percentage of failures. On the more productive land previous farming experience in the area studied did not appear to be important.

Farm Organization

Two closely related subjects come under the heading of farm organization: type of farming and size of farm. Both depend largely on soil, climate, transportation facilities, available markets, and so on. As was shown in Part I, the Great Plains are generally best suited to ranching or extensive wheat farming, either of which requires large acreages. In the South, on the other hand, social organization and limited capital have forced many farmers to farm small acreages with a labor-intensive crop, cotton.

Within broad regions there are also local variations in type of farming and size of farm that may affect foreclosure experience. These are most common in areas where soils and topography are not uniform. In central New York, for example, farmers in hilly country tend to specialize in an extensive type of dairy farming, while farmers in the valleys frequently combine intensive dairying with the production of intensive cash crops. But even where soil and other physical conditions are relatively uniform, personal desires, family needs, or limitations of capital may result in considerable differences in type and size of farm. A farmer with four sons,

TABLE A-8

Relation of Farming Experience of Borrower and Appraised Value per Acre to Land Bank Foreclosure Experience in the Northeast, 1917-29

Previous farming experience of borrower[a]	*Appraised value of farm per acre*		All farms
	Less than $60	$60 and over	
No recent farming experience in the Northeast			
Number of loans made	2,093	2,010	4,103
Percentage of loans foreclosed	7.5%	2.2%	4.9%
Recent farming experience in the Northeast			
Number of loans made	8,044	7,774	15,818
Percentage of loans foreclosed	3.9%	2.0%	3.0%
All borrowers			
Number of loans made	10,137	9,784	19,921
Percentage of loans foreclosed	4.6%	2.1%	3.4%

From *An Analysis of the Loaning Operations of the Federal Land Bank of Springfield from Its Organization in March, 1917, to May 31, 1929*, by F. F. Hill (Cornell University Agricultural Experiment Station, Bulletin 549, December 1932), Table 78, page 77. The data cover loans made by the Springfield land bank in New England, New York, New Jersey, and Pennsylvania.

[a] All persons who had had five years or more of farming experience in the Northeast immediately before the time the loan was made were classified as experienced farmers. All other borrowers were classified as inexperienced farmers.

for example, may choose intensive dairying and cash crops as the most suitable enterprises; another farmer, with two daughters, might farm the same land more extensively, producing diversified field crops that have smaller labor requirements.

The interrelationships between type of farming and size of farm, or between either of these and soil quality, make the interpretation of statistics on farm organization exceedingly difficult. A tabulation of farms by number of cows, for example, might reflect either size or type. In a predominantly dairy area, it would reflect mainly size; in a mixed farming area it would also reflect type. A farm with twelve cows might be either a small dairy farm or a large general farm where milk production is only a side line.

A simple tabulation of the number of foreclosures among farms

in different acreage groups may conceal significant relationships. When F. F. Hill found that farms of less than twenty acres had the lowest foreclosure rate among seven size groups studied—no foreclosures among 549 loans—he concluded that some factor other than mere acreage might be responsible. The fact that small full-time farms usually have small mortgages, interest on which can be paid, if necessary, from outside sources of income, did not seem quite adequate to explain their avoidance of foreclosures. A second explanation is that in the Northeast people often purchase small rural properties for suburban homes, which they sometimes operate as part-time farms. Most such properties would probably be classified as farms by the census, though they have many of the characteristics of residential real estate. A third possible explanation of the favorable experience on very small farms is that many of them were poultry farms, which can be operated successfully on small acreages, on either a part-time or full-time basis. Poultry farming was quite profitable in the Northeast during much of the period under review, and Hill's findings showed only 1.3 percent foreclosures for farms with 500 hens or more as against 3.5 percent for other farms.[7]

Hanson's findings concerning small, part-time farms in western Washington have already been mentioned.[8] In brief, certain parts of the territory seem much better adapted to part-time than to full-time farming, and the evidence clearly indicates that there the smallest farms—apparently part-time enterprises for the most part—had the best foreclosure experience.

Further evidence of good experience on small farms, found by Mereness, is presented in Table A-9. Here, some explanation is offered by the columns giving percentage of farm in crop land and amount of loan per acre, both of which decrease as acreage increases. The figures certainly imply that the small farms in southeast Alabama were being operated much more intensively than the large farms, and they may also imply that the small farms were located on generally better land, which would naturally facilitate intensive cultivation.

One single contradictory example, showing poor loan experience for small farms, was presented by Eckert and Maughan in their study of wheat farming in central Montana (Table A-10). There, however, the small farms had, on the whole, proportionally less good land than the large farms—just the opposite of what Mereness found in Alabama. Moreover, the proportion of loans made during the inflated war period, 1917-21, was higher for small farms than for others.

Eckert and Maughan also tabulated central Montana farms ac-

[7] Hill, *op.cit.*, pp. 43 f.

[8] See pages 138 f., 205, and 206.

cording to "productivity value" per farm. According to them, the productivity value of a farm is a measure of both size and soil quality. They say:

"Probably the best measure of the worth of a farm is its capitalized normal income producing ability. If the income from a farm over a number of years is known, one method of arriving at the value of the farm would be by capitalizing this return at a fair rate of interest. The value arrived at by this method has been called the productivity value. . . . In twenty-five counties of Montana, including the area used in this study, it is possible to rather accurately estimate the normal production of farms by reference to the amount of the various grades of farm and grazing land on each farm. From the analysis of land values given in Bulletin 348 of the Montana Agricultural Experiment Station, the productivity values (per acre) of the different grades of farm and grazing lands in Montana are as given below:

	Farm land	*Grazing land*
First grade	$35.00	$3.00
Second grade	18.00	2.50
Third grade	3.00	1.50
Fourth grade	1.50	1.00
Fifth grade	....	.75

"Since yields and carrying capacity have been determined for the various grades of farm and of grazing land it is evident that productivity value (per farm) is a combined measure of the size of farm and of the quality of land."[9]

However, the productivity value may also be interpreted as a measure of capital—not so much capital actually invested as present going-concern value. As such, the productivity value measures size in the financial sense rather than in the purely physical sense. Possibly that is a better measure of size. Table A-11 shows variations in the loan experience of wheat farms according to productivity value. The results are hardly surprising.

For the most part, tabulations by type of farming have shown little variation in mortgage experience. A notable exception, however, was presented by Hanson and is reproduced in Table A-12. Here, the poor experience on tree fruits is clearly due to low prices and other contributing factors discussed in Chapter 5.[10] The good experience on poultry farms recalls Hill's findings for the Northeast, where farms with 500 hens or more had better experience than others.

[9] Phil S. Eckert and Orlo H. Maughan, *Farm Mortgage Loan Experience in Central Montana* (Montana State College Agricultural Experiment Station, Bulletin 372, June 1939), pp. 25 f.

[10] See page 129.

TABLE A-9

Relation of Size of Farm to Loan Experience and Other Factors, Southeastern Alabama, 1917-31

Acres per farm	*Average percentage of farm in crop land*	*Average loan per acre*	*Percentage of loans foreclosed*	*Loss per $1,000 loaned*
1-19	91%	$31	0%	$0
20-59	79	20	5	9
60-99	72	18	9	20
100-139	66	17	14	28
140-219	62	16	19	48
220-299	60	15	21	54
300-459	57	14	30	85
460-779	54	14	28	86
780-1,319	48	11	39	129
1,320-2,639	43	8	23	102
Average	61%	$15	15%	$54

From *Farm Mortgage Loan Experience in Southeast Alabama*, by E. H. Mereness (Alabama Polytechnic Institute Agricultural Experiment Station, Bulletin 242, January 1935), Table 12, page 13. The data cover 4,750 loans.

TABLE A-10

Relation of Acreage Cultivated to Foreclosure Experience on Central Montana Wheat Farms, 1911-32

Acres cultivated, 1928-32	*Number of loans made*	*Percentage of loans*		
		Made during 1917-21	Made on 1st & 2nd grade land	Foreclosed
Less than 200	115	43%	34%	59%
200-399	115	27	52	32
400-599	55	31	45	31
600-799	33	39	45	42
800-999	20	25	40	25
1,000 or more	25	24	52	16

From *Farm Mortgage Loan Experience in Central Montana*, by Phil S. Eckert and Orlo H. Maughan (Montana State College Agricultural Experiment Station, Bulletin 372, June 1939), Table 18, page 25.

TABLE A-11

Relation of Productivity Value per Farm to Loan Experience on Central Montana Wheat Farms, 1911-32

Productivity value per farm	*Number of loans made*	*Percentage of loans foreclosed*	*Loss per $100 loaned*[a]
Less than $1,000	174	63%	$40.08
$1,000-2,999	102	44	15.24
$3,000-4,999	41	34	11.09
$5,000-9,999	50	27	11.36
$10,000-19,999	48	10	.74
$20,000 or more	15	20	.39

From *Farm Mortgage Loan Experience in Central Montana*, by Phil S. Eckert and Orlo H. Maughan (Montana State College Agricultural Experiment Station, Bulletin 372, June 1939), Table 20, page 26.

[a] Excludes a few loans for which data were not available.

TABLE A-12

Loan Experience by Type of Farming, Western Washington, 1917-32

Type of farming	*Number of loans made*	*Average amount of loan*	*Foreclosure rate*	*Loss per $1000 loaned*
Poultry	628	$1,728	7%	$15
Truck and berries	474	1,834	10	26
Dairy	2,930	3,242	11	36
General	3,513	2,098	14	50
Tree fruits	256	2,931	20	93
All types	7,801	$2,496	12%	$42

From *Federal Land Bank Loan Operations in Western Washington, 1917-49*, by Kermit O. Hanson (Iowa State College, unpublished Ph.D. thesis, 1950), Table 18, page 40.

Financial Characteristics

This section is concerned with debt load and its relation to land values. The specific factors considered are the amount loaned, the ratio of that amount to the appraised value of the farm, the amount of loan per acre, the year in which the loan was made, and the manner in which the farm was acquired by borrower.

As a measure of debt load, the amount loaned is probably in-

ferior to the ratio of loan amount to appraised value, the amount of loan per acre, or any one of several ratios relating loan carrying charges to farm income. The one study that analyzed size of loan, Warren's, indicated that foreclosure experience was much worse for large loans than for small ones.

The ratio of loan amount to appraised value has already been discussed in Chapter 6. Mortgage experience studies have repeatedly shown that both foreclosures and losses tend to be high when loans are large in relation to value. Moreover, a few cross-tabulations of loans by loan-to-value ratio and soil type have indicated that farms

TABLE A-13

Relation of Borrower's Equity in Real Estate to Loan Experience in Southeastern Alabama, 1917-31, by Soil Class of Farm

Borrower's equity as percentage of appraised value of farm[a]	*Percentage of loans foreclosed*			*Loss per $1,000 loaned*		
	Sandy loam soils	Other soils	All soil classes	Sandy loam soils	Other soils	All soil classes
80-99%	0%	7%	2%	$0	$2[b]	$1[b]
70-79%	3	11	7	2	21	9
60-69%	6	20	12	10	68	35
50-59%	11	29	19	34	115	68
30-49%	10	39	23	17	146	70
0-29%	16	44	30	42	222	131
Less than 0	19	62	43	111	176	143
Average	8%	25%	15%	$21	$99	$54

From *Farm Mortgage Loan Experience in Southeast Alabama*, by E. H. Mereness (Alabama Polytechnic Institute Agricultural Experiment Station, Bulletin 242, January 1935), Table 15, page 15. The data cover 4,742 loans.

[a] Borrower's equity is the equity above all liens at the time the loan was made, including the first mortgage.

[b] Gain.

on good land appear capable of carrying much larger loans in relation to value than farms on poor land; that is, the safe debt ratio is higher for good land than for poor land. As an example, Table A-13 shows, for specified debt loads, differences in mortgage experience between the productive sandy loam soils and other soils in southeastern Alabama.[11]

[11] What the table actually gives is the ratio of borrower's equity to the appraised value, rather than the loan-to-value ratio. This is the equity above all liens, including the first mortgage. Hence, if the equity is 60 percent of appraised value, all loans must constitute 40 percent.

Some lenders have come to accept the principle of differentiating between grades of land in formulating their lending standards; on poor land they do not lend as large a percentage of appraised value as on good land. The land banks are making increasing use of mortgage experience statistics in formulating loan policies for various grades of land. They classify loans according to land class or net income area and then ascertain the relation between debt load and loan experience for each group. As an example, Tables A-14 and A-15, which cover 23,128 loans made by the Federal Land Bank of Spokane, show first foreclosure rates, then loss rates, by debt load and net income area.

Although the qualitative principles illustrated in the two tables are applicable to lending in general, the actual foreclosure and loss rates are representative only of land bank experience in the particular areas. One of the problems encountered in analyzing the loan-to-value ratio in relation to foreclosure experience is that lenders follow different appraisal policies and use different methods. Loan-to-value ratios are, therefore, not strictly comparable among lenders. A 60 percent loan by one lender might be larger in relation to debt carrying capacity than a 75 percent loan by an-

TABLE A-14

Relation of Debt Load to Acquisition Rates on Land Bank Loans Made in 1917-32 in 76 Counties in Washington, Oregon, Idaho, and Montana; by Net Income Area

Net income area	*Debt load*[a]				
	Light	Medium	Medium heavy	Heavy	Very heavy
	Acquisition rate[b]				
1	0.8%	2.8%	5.5%	[c]	[d]
2	0.2	8.2	9.4	16.4%	0.0%
3	4.2	11.8	21.7	23.8	29.3
4	6.8	23.8	30.4	32.6	46.9
5	13.7	33.6	40.8	54.0	62.8
All areas	3.9%	13.7%	20.7%	28.5%	43.0%

From a special tabulation prepared by Alexander Joss, Director of Research, Farm Credit Administration of Spokane. The data cover 23,128 loans.

[a] Debt loads are calculated as percentages of the normal agricultural value of the farm in 1936-42, and are classified approximately as follows: light, 39 percent or less; medium, 40-65 percent; medium heavy, 66-75 percent; heavy, 76-85 percent; and very heavy, 86 percent and over.

[b] Acquisitions of farm real estate through October 31, 1948 on loans made in 1917-32, as a percentage of the total amount loaned.

[c] Loans totaled less than $1,000.

[d] No loans.

other. Obviously, credit terms must be adjusted to the lender's own appraisal technique, and the lender who wishes to base his credit terms on experience statistics must work up an analysis of his own records for the purpose.

A third measure of debt burden sometimes considered is the amount of loan per acre. It is probably a poor measure because it reflects two other factors—the loan-to-value ratio and the value per acre. The mere knowledge that farm land is carrying a debt of, say,

TABLE A-15

Relation of Debt Load to Loss Rates on Land Bank Loans Made in 1917-32 in 76 Counties in Washington, Oregon, Idaho, and Montana; by Net Income Area

	Debt load[a]				
Net income area	Light	Medium	Medium heavy	Heavy	Very heavy
			Loss per $1,000 loaned[b]		
1	$+5	$2	$2	[c]	[d]
2	5	1	3	$23	0
3	13	26	56	63	$80
4	9	75	117	118	181
5	66	171	222	309	353
All areas	$12	$36	$63	$101	$176

From *Federal Land Bank of Spokane Reserve Report*, October 31, 1948. The data cover 23,128 loans.

[a] Debt loads are calculated as percentages of the normal agricultural value of the farm in 1936-42, and are classified approximately as follows: light, 39 percent or less; medium, 40-65 percent; medium heavy, 66-75 percent; heavy, 76-85 percent; and very heavy, 86 percent and over.

[b] Losses through October 31, 1948 on loans made in 1917-32, as a percentage of the total amount loaned. Plus signs indicate gains.

[c] Loans totaled less than $1,000.

[d] No loans.

$100 an acre provides very little information concerning the real debt burden or the probability of default. On land valued at $400 an acre, a $100 loan would be conservative; on $160 land it might be liberal; and on $75 land it would probably be excessive. It is hardly surprising, therefore, that different investigators obtained contradictory results on loan per acre. Eckert and Maughan, for instance, found somewhat better than average experience on farms with a small loan per acre, whereas Mereness found slightly worse than average experience.

The debt load that a farm is capable of supporting depends upon fluctuations in farm prices as well as on the quality of the land.

In periods of prosperity, land values are high and credit terms are apt to be generous. Keen competition for loans usually develops, and the tendency is to make more optimistic appraisals and to lend a larger percentage of appraised values. Even when the appraiser conscientiously attempts to arrive at a long-term value, and the lender attempts to gear his loan policy to the long-term outlook, both lender and appraiser will be influenced by the current market. One would expect, as a result, that many loans made during periods of farm prosperity would exceed the long-term debt-carrying capacity of the farms mortgaged. In the next period of distress such loans would break down more readily than loans made in more normal periods.

Unfortunately, foreclosure experience studies do not shed much light on the important subject of price influences at the time loans were made. Table A-16, taken from Eckert and Maughan, shows

TABLE A-16

Relation of Period in Which Loan Was Made to Foreclosure Experience on Central Montana Wheat Farms, 1911-37

Period in which loan was made	*Number of loans made*	*Foreclosures*	
		Number	Percent
1911-19	165	115	70%
1920-24	190	70	37
1925-29	119	28	24
1930-32	55	2	4
1933-37	543	11	2
1911-32	529	215	41
1911-37	1,072	226	21%

From *Farm Mortgage Loan Experience in Central Montana*, by Phil S. Eckert and Orlo H. Maughan (Montana State College Agricultural Experiment Station, Bulletin 372, June 1939), Table 4, page 10.

much higher incidence of foreclosure among the earlier loans. Those made before 1919 were particularly bad. Similar though much less striking results were found in the studies of Hill and of Ackerman and Norton. Since farm land values and agricultural prosperity were extremely high during World War I, it is easy to conclude that the poor experience on loans made then was due to excessive lending on inflated values. But there is another possible explanation, namely that the early loans have had a greater opportunity to default than the later ones. Hill's study, for example, where only loans foreclosed before June 1, 1929 were included in the fore-

closed category, showed only 0.5 percent foreclosure among loans made in 1927 as against 8.4 percent for loans made in 1917.[12] But since the 1927 loans had only two years in which to develop trouble, while the 1917 loans had twelve years, the foreclosure rates are not comparable.

The last factor included under financial characteristics is the manner in which the farm was acquired by the borrower. It does not appear to be particularly important. Statistics on the manner of acquisition tend to be confusing, first because each investigator used a somewhat different classification system, and second because different investigators sometimes obtained contradictory results. For example, Hill found slightly worse than average results for purchased farms in contrast to farms acquired by trade, inheritance, or deals with relatives. Ackerman and Norton found better than average results for farms purchased with a cash down payment. Variation from the average appeared small, however, in both cases.

[12] Hill, *op.cit.*, Table 55, p. 55.